# THE EFFECT OF CONCEPT ATTAINMENT LEARNING MODEL (CAM) TO X CLASS STUDENTS' CRITICAL THINKING ABILITY

**Ummi Hiras Habisukan[1) a)], Munir[2)], Dini Afriyansyah[3)] , Dewi Sundari[4)]**

[1), 2), 3), 4)] *Departement of Biology Education, Faculty of Education and Teacher Training, UIN Raden Fatah Palembang*
*Jl. Prof. KH Zainal Abidin Fikri No. 1A KM 3.5, Palembang 30126, Indonesia.*

[a)]*ummihirash @ gmail.com*

## ABSTRACT

This research aims to determine whether the learning model Attainment Concept Model (CAM) effect against High School Students Critical Thinking Skills. This research uses quasi- experimental method with Pretest - Posttest Research Design Control Group Design . Sampling is done by saturated sampling technique. The sample of this research is X.1 dan X.2 class of science group study. The results showed that there are differences in critical thinking ability at animalia material. Improvement Critical thinking ability can be seen in the results before using learning model indicator that are Analysis, Evaluation, Inference (Conclusion), Explanation, Self regulation are 36%, 37%, 41 %, 45%, and 46 %. After using Learning Model on the indicator interpretation, analysis, evaluation, inference (conclusion), explanation, Self-regulation (setting themselves) are 80%, 84%, 85%, 85%, 83% and 84%. The results showed that learning model can enhance students critical thinking ability. The results of the statistics obtained $t_{arithmetic}$ = 3.474 and $t_{table}$ = 1.666 with df (degrees of freedom) by 73 with a significant level of 5%, therefore $t_{arithmetic} > t_{table}$ is 3.474> 1.666 and 0.001 significance value> 0.05. Based on the hypothesis test, it can be concluded that the influence of learning model Concept Attainment Model on students' critical thinking skills for X class.

**Keywords:** *animalia, Concept Attaiment Model (CAM), critical thinking, learning model*

## INTRODUCTION

National education aims to develop the potential of learners to become human beings who believe and piety to God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become citizens of a democratic and responsible. Education is also the most important element in improving human resources. Through human education will master the science that can improve human resources and can solve the problems faced. This is in line with the law number 20 of 2003 on the national education system that the national education function to develop the ability and form the character and civilization of a dignified nation in order to educate life of the nation (Law No. 20 Year 2003).

Critical thinking skills are also mandated by the 2013 curriculum emphasizes students to think critically in identifying, understanding. solve problems, and apply learning materials. The reality in school, Biology learning has not been much oriented toward the habituation and mprovement of high-order thinking skills skills (critical thinking), but still focuses on the results of low-level cognitive learning. Students are expected to absorb information passively and then remember it during the test.

The low critical thinking skills also occur in high school students . Based on the observation and observation of six aspects of critical thinking (Fascione, 2015) in Senior High School Palembang obtaining data that the critical thinking ability of learners is still low . That can be demonstrated by the results of initial tests given to students of class XI Senior High School in Palembang consisting of 30 multiple choice questions with Critical Thinking Indicator. Based on the results obtained can be seen that from 25 students, the ability of critical thinking high students only 20%, the ability to think critically moderate 44% and 36% critical thinking ability of students is still low. Based on each aspect of critical thinking, 24% aspect of interpretation was obtained, 40% analysis aspect, evaluation aspect 56%, 32% conclusion, 48% explanation aspect and self regulation 24%. Based on the results of observations and direct interviews with teachers Biology Palembang High School is explained that students have difficulty in understanding the concept of Biology. Interviews were also conducted with high school class XI students. In addition to interviews with high school biology teachers,

based on the observation of the value of Biology lessons in the class has not reached the Minimum Exhaustiveness Criteria is defined by the value of 75. Precise in the material Animalia tend to be low because of lack of understanding with concepts related to the solution of the problem. To foster a concept in the lesson, a teacher needs to teach in a real context by relating to the surrounding environment. This will be able to develop the ability to think critically of the material to be taught. Therefore the application of learning teachers in the classroom generated varied using models of learning there is.

The use of appropriate learning model, an alternative time to overcome the problem of low absorption of students to Biology lessons. Each learning model must be appropriate to achieve a particular goal. For different purposes teachers should use different presentation techniques to achieve learning objectives. One of the appropriate learning models for improving students' critical thinking skills is the conceptual concept model (Concept Attainment Model). According to Bruner which cited Dahar (1996), conceptual achievement model (Concept Attainment Model) built with regard to the study of student thingking. This is similar to the opinion of Joyce and Weil (2009) that state, "learning model to achieving the concept (Concept Attainment Model) to sharpen skills basic thinking." This shows that the achievment concepts model contains lesson thinks students. If you want to achieve goals learning then needs to cultivate students thinking skills, especially critical thinking skills absolutely necessary. Learners who have "reached the concept" are not only able to memorize a number of concepts he has learned, but he must also be able to apply them to other aspects by developing the concept of thinking (Martomidjojo and Nuryani, 2011).

**Model Concept Attainment Model**

According to Joyce and Weil (2009) that structures teaching or syntax model achievement concept are the stages of activity from model learning concept. Model learning concept has three phases :

a) Data presentation and concept identification stage

Teacher give examples to students, example it is data "example positive" and "example negative" concept separate. The data could form events, human, objects, story, images or others which can be distinguished one same other and not yet given concept name. Student told by the teacher about a positive example that has one general idea.

Student assignment is develop one hypothesis about character or characteristic features from concept the in a way compare character and characteristic in positive example and negative. Examples presented in a instructions y ang prearranged and labeled with "Yes" or "No". On finally, students are required for naming their concepts and deliver rules or definitions of concepts according to their most essential.

b). Testing of conceptual achievement

Students tested the concept and then students making examples according to them. The next step teachers and students correct positive examples and negative examples and then revise which samples are correct, then the students look for other examples that fit the concept.

c). Analysis of thinking strategies

At the analytical stage of thinking strategy, students describe their thoughts, discuss the role of traits and hypotheses and discuss the types and varieties of hypotheses. Students analyze their thinking strategies to achieve the intended concept. Students thinking strategies vary, some try and purify the concept, and some extend the concept. Students are asked to disclose reasons that are pleasing to make additional examples, formulate concepts in their own words and describe the pace of completion of a concept.

**Indicators of Critical Thinking Skill**

The indicator of critical thinking ability used in this research is the critical thinking faculty of Facione (2015), such as interpretation, analysis, evaluation, inference, explanation, and self-regulation. Interpretation is the ability to understand and express the meaning / meaning of the problem . Analysis is the ability to identify and infer relationships between statements, questions, concepts, descriptions, or other forms. Evaluation is the ability to access the credibility of statements / representations and is able to logically access the relationships between statements, descriptions, questions, and concepts. Inference is the ability to identify and obtain the elements needed to draw conclusions. Explanation is the ability to define and reason logically based on the results obtained. While the last indicator of self-regulation is the ability to monitor the cognitive activity of a person, the elements used in problem solving activities, especially in applying the ability to analyze and evaluate.

## RESEARCH METHOD

The research method used is Quasi Experimental Design. with research design pretest-posttest control group design. Subjects in this study were 75 students of X class in one school in the city of Palembang. Concept Attainment Model learning model This model was chosen by researchers to guide students to connect all information that has been obtained to the whole concept of Animalia The research instrument used is in the form of studentsn critical thinking ability test, assessment rubric and questionnaire. The data were analyzed using Microsoft Excel and SPSS 23.

## RESULT AND DISCUSSION

Data pretest result of student are presented in Figure 1.

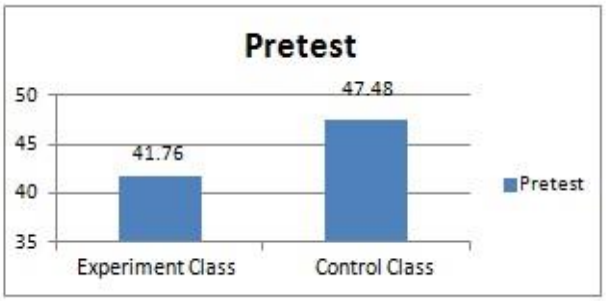


**Figure 1. Pretest Average Score Diagram**

Based on the bar chart above it can be seen that the average pretest of the experimental class is 41,76 and the control class is 47,48 which means the average value of *pretest of* control class is higher than the experimental class.

**Normality Test**

**Table 1. Pretest Normality Test Results with Shapiro-Wilk**

| Value | Significant | | Information |
|---|---|---|---|
| | Class Control | Class Experiments | |
| ***Pretest*** data | 0, 221> 0.05 | 0, 118> 0.05 | Normally distributed |
| ***Posttest*** data | 0.058> 0.05 | 0.120> 0.05 | Normally distributed |

Based on the result of normality test that has been obtained, it can be seen that *Pretest* normality test value for experiment class and control class that is 0, 221> 0,05 and 0,118> 0,05, While at test value of *posttest* normality for experiment class and control class that is of 0.058> 0.05 and 0.120> 0.05, then on the basis of decision making the *shapiro-Wilk* normality *test, the* two data declared normal distribution.

***Homogeneity Test***

**Table 2 . Pretest Levene Statistic Test Results**

| Value | Levene Statistic | df 1 | df 2 | Sig |
|---|---|---|---|---|
| Pretest | 2,017 | 1 | 73 | 0,160 |
| Posttest | 0,590 | 1 | 73 | 0,455 |

Based on the result of homogeneity test (Sugiyono, 2013) , it has been found that the significant value of *pretest* homogeneity test for experiment class and control class is 0,160> 0,05, while *posttest* homogeneity test for experiment class and control class is 0,445> 0,05 then on the basis of decision making in the *Levene Statistic* homogeneitytest , *it* can be stated that both groups have the same or homogeneous varian.

**Hypothesis**

**Table 3. Pretest-Posttest test results with t-test**

| Value | Class | Mean | $t_{count}$ | $t_{table}$ | Sig | Conclusion |
|---|---|---|---|---|---|---|
| Pre test | Experiment | 41.76 | -1,926 | 1.666 | 0.001 | $H_a$ rejected |
| | Control | 47.48 | | | | $H_o$ accepted |
| Pos ttest | Experiment | 83.55 | 3,474 | 1.666 | 0.001 | $H_a$ rejected |
| | Control | 75.16 | | | | $H_o$ accepted |

Based on the above table for the value of *pretest* in the experimental and control classes obtained that the value of $t_{count}$ equal to -1.926 based on the distribution table, value of $t_{table}$ for df = 73 equal to 1.666 and the value of significance 0.058> 0.05. While the value of *posttest* in the experimental class and the control is obtained that $_t$ value of 3.474 based distribution table, $t_{table}$ for df = 73 at 1.666 and 0.001 significance value <0.05.With the value of $t_{count} > t_{table,}$ then in accordance with the basis of decision-making in test-t Independent sample, it can be concluded that $H_0$ accepted and $H_a$ rejected. The decision obtained is accepted $H_{0,}$ which means that students in the experimental class and the control class Topic Animalia not significantly different or the same initial knowledge.

**N-gain Value**

Based on the above table, it can be seen that the N-gain Experiment class is 0.74 which means entering into high category. Whereas, it can be seen that the N-gain control class is 0.59 which means it is in the medium category. Then it can be concluded that the N-gain in the experimental class is higher than the N-gain in the control class. The comparison of the experimental class N-gain data with the control class can be seen in in Figure 3.

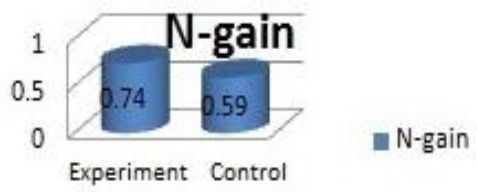


**Figure 3. Average Score Bar Diagram of N-Gain**

***Analysis of the Critical Thinking Skills of Students***

The result of the analysis of the students critical thinking through the descriptions of cognitive ability used in the solution of the problem between the experimental class and the control class based on the critical thinking ability of the percentage of N-gain from the pretest and posttest results are presented in the Figure 4.

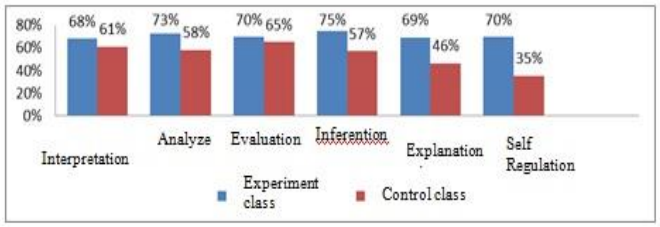


**Figure 4. N-Gain Pretest And Posttest of Experiment Class and Control Class.**

Based on the bar chart above can be seen that the percentage of each indicator of critical thinking ability, that is obtained interprestasi analysis, evaluation, conclusion and self-regulation, between the experimental group and control as shown in the diagram above. For experimental class N-gain for critical thinking ability on interpretation indicator, analysis, evaluation, conclusion, explanation and self-regulation are 68%, 73%, 70%, 75%, 69%, 70%, respectively. In the control class the percentage of N-gain critical thinking on the interpretation indicators, analysis, evaluation, conclusion of explanation and self-regulation in sequence is 61%, 58%, 65%, 57%, 46%, 35% Increased ability of the highest critical thinking the experimental class

achieved in the indicator of inference (conclusion) respectively by 75%. While the control class occurs on the indicator about each evaluation in sequence of 65%. Meanwhile, in the opinion of Liliasari (2003), argued that critical thinking ability should be implanted in children at the age of 11 years and above children reflective thinking using assumptions and hypotheses. And his thinking ability is no longer related but reaches the past and the future.

**Discussion**

Based on the analysis of research it is known that the value of pretest on the class experimental and control classes, after the normality test and homogeneity test and t-test with SPSS 23, the results obtained are $_t$ $t_{arithmetic}$= 3.474> $t_{table}$ = 1.666 then $H_0$ in reject and $H_a$ accepted, which means that students in the experimental class and control class on environmental change materials are not significantly different or have the same initial knowledge. The absence of pretest result differences here can be known from the process of residual activity taught the pretest thing this can happen because they have not studied the material they are working on. However, if the student can associate the material in the pretest with the knowledge they have before then the student will be able to answer the question without having to ask his friends. According Pantiwati (2015), states that in the present, learners tend to sit still listening without being able to develop information obtained or discussed, basically students have critical thinking skills in learning such as questioning skills, hypothesis, classification, observation and interpretation.

Posttest value in experiment class and control class, after normlaity test, homogeneity test and t-test with SPSS 23 result obtained is $t_{count}$ = 3,474 <$t_{table}$ = 1,666 then $H_0$ accepted and $H_a$ rejected, which means experiment class and the control class on the human circulatory system material is significantly different or has different knowledge. The Concept Attaiment Model is a learning model designed to develop inductive thinking skills, but also to analyze and develop concepts in students (Joyce and Weil, 2009).

N-gain (difference between posttest and pretest value), which shows improvement of students' critical thinking ability after learning. The average N-gain in the experimental class is 0.74 which is in the high category, whereas in the 0.59 control class which is in the medium category. It can be concluded that the improvement of critical thinking ability is higher in the experimental class than the control class. This is in line with Prayitnos (2014) research, that the Concept Attainment model is better than the conventional model, more effective in terms of conceptualizing the more effectively in concept retention than in conventional models.

Based on the above description shows that different implementation that resulted in different outcomes between groups of experiments taught using concept model attainment with control group using conventional model (discussion, lecture, and question and answer). Therefore, it turns out that the Attainment concept model has influenced the students' critical thinking skill in the animalia material in grade X of Senior High School Palembang.

**CONCLUSION**

Based on the result of this research, it can be concluded that there is effect of learning model of Concept Attainment Model on students' critical thinking ability on animalia material of X class. This is because the conceptual learning model (Concept Attainment Model) sharpens basic thinking skills. It also shows that in the model of achievement the concept directs students to think critically.

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